

CLAIMS

What Is Claimed Is:

- 1           1.       An orthosis comprising:  
2                   a hip engaging unit formed to conform to the contours of a human hip;  
3                   an appendant member formed to extend diagonally about and to be fixed  
4           to a human appendage, one side of the appendant member is longitudinally  
5           displaced from an opposite side of the appendant member to provide  
6           corresponding longitudinally displaced fixation points to prevent rotational  
7           displacement when mounted about the appendage; and  
8                   a connector assembly interconnecting the hip engaging member and the  
9           appendant member.
- 1           2.       The orthosis of Claim 1, wherein the connector assembly includes an  
2           articulated joint member and an adjustable linkage system extending across and  
3           connected on both sides of the articulated joint, including a first link member that can be  
4           adjusted in length to control the movement of the articulated joint,
- 1           3.       The orthosis of Claim 2, wherein the connector assembly includes an  
2           adjustable hinge member to provide a predetermined range of movement between the hip  
3           engaging member and the appendant member.
- 1           4.       The orthosis of Claim 3 further including a second and third link  
2           member connected respectively to the first link member and respectively to either side  
3           of the articulated joint, to form an approximate parallelogram.

1           5.       The orthosis of Claim 2, wherein the first link member includes a turn  
2 buckle, which is adjustable to vary the length of the first link member.

1           6.       The orthosis of Claim 2, wherein an adjustable hinge forms a portion  
2 of the adjustable linkage system and has a first rotational axis, which is offset by  
3 approximately 90° from a second rotational axis of the articulated joint, the adjustable  
4 hinge can be set to limit a range of flexion, while movement of the articulated joint  
5 provides either adduction or abduction.

1           7.       The orthosis of Claim 2, wherein the articulated joint has a rotational  
2 axis and adjustment of the adjustable linkage system provides adduction and  
3 abduction movements about the rotational axis.

1           8.       The orthosis of Claim 7 further including an adjustable hinge adjacent  
2 the articulated joint, the adjustable joint has a first rotational axis offset by  
3 approximately 90° from a second rotational axis of the articulated joint, the first link  
4 member is movably affixed adjacent the adjustable hinge and radially offset from the  
5 first rotational axis, whereby movement of the adjustable hinge about the first  
6 rotational axis will cause movement of the articulated joint about the second rotational  
7 axis.

1           9.       The orthosis of Claim 8, wherein a first support post is connected  
2 adjacent one side of the articulated joint and a second support post is connected  
3 adjacent the other side of the articulated joint and the first link member is pivotally  
4 connected between the first and second support posts.

1           10.     The orthosis of Claim 9, wherein the first link member includes a turn  
2     buckle which is adjustable to vary the length of the first link member.

1           11.     The orthosis of Claim 2, wherein the connector assembly includes a  
2     support plate having a securement portion adjacent an anchor location on the hip  
3     engaging unit and a distal portion for linking with the appendant member which is  
4     attachable to the user appendage, the securement portion having a curved  
5     configuration and a fastening structure that enables an adjustable movement relative  
6     to the anchor location to permit sliding movements of the distal end towards and away  
7     from the user; and a fastener member for securing the curved configuration to the  
8     anchor location to maintain a desired position for the distal end relative to the user.

1           12.     The orthosis of Claim 11, wherein the anchor location has a  
2     complementarily curved location to the curved configuration of the securement  
3     portion.

1           13.     The orthosis of Claim 12, wherein the support plate has a straight distal  
2     portion.

1           14.     The orthosis of Claim 13, wherein the securement portion has an  
2     elongated slot for receiving the fastener member.

1           15.     The orthosis of Claim 11, wherein the hip engaging member includes  
2     first and second hip engaging members formed to encircle and conform to the  
3     contours of a human hip and a connector plate adjustably interconnecting the first and

4 second hip engaging members, the connector plate including a bridge member  
5 extending vertically upward and across relative to connections with the respective first  
6 and second hip engaging members to stiffen the connector plate from movement  
7 traverse to a plane centrally aligned with a circumference of the hip support assembly,  
8 while permitting a greater degree of flex of the connector plate in directions lying  
9 across the plane.

1 16. The orthosis of Claim 15, wherein the connector plate includes a band  
2 member with respective apertures for receiving fasteners to affix the connector plate  
3 to the respective hip engaging members.

1 17. The orthosis of Claim 16, wherein the bridge member is sufficiently  
2 spaced from the band member to provide a handle for grasping by a human hand.

1 18. The orthosis of Claim 17, wherein the first and second hip engaging  
2 members are respectively formed with rigid plastic outer shells configured to conform  
3 to the sides of the human hip.

1 19. The orthosis of Claim 18, wherein the connector plate extends across a  
2 rear of the human hip and is formed of a flexible plastic material.

1 20. The orthosis of Claim 15, wherein the appendant member is bifurcated  
2 into a first section and a second section which are adjustable connected together to  
3 permit mounting on the user.

1           21.    The orthosis of Claim 20, wherein the appendant member is a  
2 relatively rigid plastic band of a diagonal cylindrical configuration.

1           22.    The orthosis of Claim 21, wherein the appendant member is affixed by  
2 one section of the first and second sections to an anchor plate.

1           23.    The orthosis of Claim 22, wherein the anchor plate has a slot for  
2 removably securing the other section of the first and second sections.

1           24.    The orthosis of Claim 23, wherein distal ends of the first and second  
2 sections relative to the anchor plate are adjustably connected together.

1           25.    The orthosis of Claim 24, wherein one of the distal ends is larger than  
2 the other distal end and includes an elongated slot and a fastener member for securing  
3 the distal ends together by fastening within the slot.

1           26.    The orthosis of Claim 24, wherein a frictional surface is provided on  
2 each distal end to enhance a gripping securement when the fastener member exerts a  
3 compression force to the distal ends.

1           27.    The orthosis of Claim 24, further including a female connector secured  
2 to the anchor plate and an adjustable strap with a male connector secured to the other  
3 section

1           28.    The orthosis of Claim 24, further including a flexible pad member  
2 connected to the sleeve member for interfacing with the user appendage.

1           29.    The orthosis of Claim 1 wherein the connector assembly includes an  
2   adjustable hinge unit having a variable setting hinge member to control flexion and  
3   extension of the human appendage and a pivotal joint member to control abduction  
4   and adduction.

1           30.    The orthosis of Claim 29 wherein the pivotal joint member is  
2   operatively connected to a follower and cam unit to provide a predetermined  
3   abduction and adduction as the human appendage flexes and extends.

1           31.    The orthosis of Claim 30 wherein the pivotal joint member is mounted  
2   on the variable setting hinge member in alignment with an axis of rotation of the  
3   variable setting hinge member and the follower and cam unit is concentrically  
4   mounted about the axis of rotation.

1           32.    An orthosis comprising:  
2                   a hip engaging member formed to conform to the contours of a human  
3   hip;  
4                   an appendant member formed to extend about and be fixed to a human  
5   appendage;  
6                   a support plate having a securement portion adjacent an anchor  
7   location on the hip engaging member and a distal portion for linking with the  
8   appendant member which is attachable to the user appendage, the securement  
9   portion having a curved configuration and a fastening structure that enables an

10 adjustable movement relative to the anchor location to permit sliding  
11 movement of the distal end towards and away from the user; and  
12 a fastener member for securing the curved configuration to the anchor  
13 location to maintain the desired position for the distal end relative to the user.

1 33. The orthosis of Claim 32, wherein the anchor location has a  
2 complementarily curved location to the curved configuration of the securement  
3 portion.

1 34. The orthosis of Claim 33, wherein the support plate has a straight distal  
2 portion.

1 35. The orthosis of Claim 33, wherein the securement portion has an  
2 elongated slot for receiving the fastener member.

1 36. An orthosis comprising:  
2 a hip engaging unit formed to conform to the contours of a human hip  
3 having first and second hip engaging members formed to encircle and conform  
4 to the contours of a human hip, and a connector plate adjustably  
5 interconnecting the first and second hip engaging members, the connector  
6 plate including a bridge member extending vertically upward and across  
7 relative to connections with the respective first and second hip engaging  
8 members to stiffen the connector plate from movement traverse to a plane  
9 centrally aligned with a circumference of the hip support assembly, while

10           permitting a greater degree of flex of the connector plate in directions laying  
11           across the plane;

12                   an appendant member formed to extend about and to be fixed to a  
13           human appendage; and

14                   a connector unit interconnecting the hip engaging member and the  
15           appendant member.

1           37.    In an orthotic brace, the improvement of an adjustable support plate  
2           assembly for positioning an appendant orthotic member at an operative position  
3           relative to an appendage of the user, comprising:

4                   a support plate having a securement portion adjacent an anchor  
5           location on the orthotic brace and a distal portion for linking with the  
6           appendant orthotic member which is attachable to the user appendage, the  
7           securement portion having a curved configuration and a fastening structure  
8           that enables an adjustable movement relative to the anchor location to permit  
9           sliding movements of the distal end towards and away from the user; and

10                   a fastener member for securing the curved configuration to the anchor  
11           location to maintain a desired position for the distal end relative to the user.

1           38.    The orthotic brace of Claim 37, wherein the anchor location has a  
2           complementarily curved location to the curved configuration of the securement  
3           portion.



1           39.     The orthotic brace of Claim 38, wherein the support plate has a straight  
2     distal portion.

1           40.     The orthotic brace of Claim 38, wherein the securement portion has an  
2     elongated slot for receiving the fastener member.

1           41.     The orthotic brace of Claim 38, wherein an anchor plate of a  
2     complementarily curved configuration is mounted on the anchor location to receive  
3     the fastener member.

1           42.     The orthotic brace of Claim 38, wherein the securement portion has a  
2     pair of elongated slots, and a pair of fastener members are configured to fit within the  
3     elongated slots and fasten to the anchor location.

1           43.     In an orthotic hip support assembly having first and second hip  
2     engaging members formed to encircle and conform to the contours of a human hip,  
3     the improvement comprising:

4                     a connector plate adjustably interconnecting the first and second hip  
5     engaging members, the connector plate including a bridge member extending  
6     vertically upward and across relative to connections with the respective first  
7     and second hip engaging members to stiffen the connector plate from  
8     movement traverse to a plane centrally aligned with a circumference of the hip  
9     support assembly, while permitting a greater degree of flex of the connector  
10    plate in directions lying across the plane.

1           44.     The orthotic hip support assembly of Claim 43, wherein the connector  
2     plate includes a band member with respective apertures for receiving fasteners to affix  
3     the connector plate to the respective hip engaging members.

1           45.     The orthotic hip support assembly of Claim 44, wherein the bridge  
2     member is sufficiently spaced from the band member to provide a handle for grasping  
3     by a human hand.

1           46.     The orthotic brace support assembly of Claim 44, wherein the  
2     apertures are elongated slots with surrounding perimeters of a textured configuration.

1           47.     The orthotic hip support assembly of Claim 43, wherein the first and  
2     second hip engaging members are respectively formed with rigid plastic outer shells  
3     configured to conform to the sides of the human hip.

1           48.     The orthotic hip support assembly of Claim 43, wherein the connector  
2     plate extends across a rear of the human hip and is formed of a flexible plastic  
3     material.

1           49.     In an orthotic brace that is to be affixed to an appendage of a user, the  
2     improvement comprising:

3                   a sleeve member extending about a circumference of the appendage,  
4                   wherein one side of the sleeve member is longitudinally displaced from an  
5                   opposite side of the sleeve member along the appendage to provide

6 corresponding displace fixation locations to prevent rotational displacement  
7 about the appendage.

1 50. The orthotic brace of Claim 49, wherein the sleeve member is  
2 bifurcated into a first section and a second section which are adjustably connected  
3 together to permit mounting on the user.

1 51. The orthotic brace of Claim 50, wherein the sleeve member is a  
2 relatively rigid plastic band of a diagonal cylindrical configuration.

1 52. The orthotic brace of Claim 50, wherein the sleeve member is affixed  
2 by one section of the first and second sections to an anchor plate.

1 53. The orthotic brace of Claim 52, wherein the anchor plate has a slot for  
2 removably securing the other section of the first and second sections.

1 54. The orthotic brace of Claim 52 wherein distal ends of the first and  
2 second sections relative to the anchor plate are adjustably connected together.

1 55. The orthotic brace of Claim 52, wherein one of the distal ends is larger  
2 than the other distal end and includes an elongated slot and a fastener member for  
3 securing the distal ends together by fastening within the slot.

1 56. The orthotic brace of Claim 55, wherein a textured frictional surface is  
2 provided on each distal end to enhance a gripping securement when the fastener  
3 member exerts a compression force to the distal ends.

1           57.     The orthotic brace of Claim 52 further including a female connector  
2     secured to the anchor plate and an adjustable strap with a male connector secured to  
3     the other section to provide a releasable locking.

1           58.     The orthotic brace of Claim 46 further including a flexible pad member  
2     connected to the sleeve member for interfacing with the user appendage.

1           59.     In an orthotic brace that has an articulated joint, the improvement  
2     comprising:  
3                 an adjustable linkage system extending across and connected on both  
4     sides of the articulated joint, including a first link member that can be adjusted  
5     in length to control the movement of the articulated joint.

1           60.     The orthotic brace of Claim 59 further including a second and third  
2     link member connected respectively to the first link member and respectively to either  
3     side of the articulated joint to form an approximate parallelogram.

1           61.     The orthotic brace of Claim 59, wherein the first link member includes  
2     a turnbuckle which is adjustable to vary the length of the first link member.

1           62.     The orthotic brace of Claim 59, wherein an adjustable hinge forms a  
2     portion of the adjustable linkage system and has a first rotational axis, which is offset  
3     by approximately 90° from a second rotational axis of the articulated joint, the  
4     adjustable hinge can be set to limit a range of flexion, while movement of the  
5     articulated joint provides either adduction or abduction.

1           63.     The orthotic brace of Claim 59, wherein the articulated joint has a  
2     rotational axis and adjustment of the adjustable linkage system provides adduction  
3     and abduction movements.

1           64.     The orthotic brace of Claim 63 further including an adjustable hinge  
2     adjacent the articulated joint, the adjustable hinge has a first rotational axis offset by  
3     approximately 90° from a second rotational axis of the articulated hinge, the first link  
4     member is movably affixed adjacent the adjustable hinge and radially offset from the  
5     first rotational axis, whereby movement of the adjustable hinge about the first  
6     rotational axis will cause movement of the articulated joint about the second rotational  
7     axis.

1           65.     The orthotic brace of Claim 64, wherein a first support post is  
2     connected adjacent one side of the articulated joint and a second support post is  
3     connected adjacent the other side of the articulated joint and the first link member is  
4     pivotally connected between the first and second support posts.

1           66.     The orthotic brace of Claim 65, wherein the first link member includes  
2     a turnbuckle which is adjustable to vary the length of the first link member.